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ABSTRACT

Temperament and objective and subjective measures of academic competence were interrelated in order to test two alternative models: (1) a direct effects model stressing intraorganismic, noncontextually mediated links; and (2) a developmental contextual model emphasizing social interactional processes between students and teachers. Data from the Pennsylvania Early Adolescent Transitions Study were also used in the test. Results of LISREL analyses, both at the end of grade 6 and the end of grade 7, supported the developmental contextual model, and indicated that there were significant paths between second-order temperament factors and teachers' ratings of students' academic competence. In turn, these ratings were related to students' self-rated competence, to grade 6 and 7 grade point averages, and to grade 6 scores on a standardized achievement test. In sum, individual differences in developmental change occurred by means of person-context relations evoked by a person's characteristics of individuality. Findings are discussed in regard to the possible role of temperament in moderating early adolescent coping. (RH)

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EARLY ADOLESCENT TEMPERAMENT AND ACADEMIC COMPETENCE: TESTS OF "DIRECT EFFECTS' AND DEVELOPMENTAL CONTEXTUAL MODELS

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ABSTRACT

Using data from the Pennsylvania Early Adolescent Transitions Study (PEATS), temperament and objective and subjective measures of academic competence were interrelated in order to test two alternative models: The "direct effects" model stresses intraorganism, non-contextually mediated links, while the "developmental contextual" model emphasized social interactional processes between students and teachers. In support of the developmental contextual notion, the results of LISREL analyses, both at the end of grade 6 and at the end of grade 7, indicated that significant paths existed between second-order temperament factors and teachers' ratings of students academic competence. In turn, these ratings were related to students' self-rated competence, to grade 6 and grade 7 grade point averages, and to grade 6 scores on a standardized achievement test. These findings are discussed in regard to the possible role of temperament in moderating early adolescents coping with stressors of this developmental period.

INTRODUCTION

Temperament has been identified as an important domain of early adolescent individuality, one linked to variation in the person's social and personal adjustment (Lerner, 1987; Thomas & Chess, 1977). Two models have been forwarded to account for these relations--a developmental contextual model (Lerner & Kaufman, 1985), and a personological, or acontextual, one (Plomin & Daniels, 1984). The manner in which characteristics of temperamental individuality are related to psychosocial functioning differ within the two models. Within the personological view there is believed to be a direct causal link between temperament and psychosocial functioning. Alternatively, in the developmental contextual perspective, the individual's social context mediates the link between temperament and psychosocial functioning: Adolescents, on the basis of their characteristics of organismic individuality (e.g., regarding temperament), evoke differential reactions in significant others; these reactions feed back to the individual and influence his/her further psychological functioning.

AIMS

1. Using structural equation modeling (i.e., LISREL; Joreskog & Sorbom, 1984) procedures, the primary analyses of this study were directed at appraising whether any significant relations exist between temperament and either "objective" academic competence (as indexed by California Achievement Test/Form C, or CAT/C scores; CTB, McGraw-Hill, 1980) or school performance based academic competence (as indexed by grade point average, or GPA). The data analytic issue addressed was whether these relations involved: (a) only paths among these organismic

and competence variables, as would be predicted by the "direct effects" model; and/or involved as well (b) paths which included variables indexing teachers' judgments of scholastic competence and subjects' self-perceived competence.

2. A second, and exploratory issue, which the study addressed was whether the relationships among temperament, context, and academic competence were constant in the face of a broader contextual change, i.e., one involving the transition from elementary school to junior high school. That is, the data analytic issue addressed in "1," above, was broadened to consider constancy or change in the relations from the end of grade 6 (in elementary school) to the end of grade 7 (in junior high school).

METHOD

Subjects

Using data from the Pennsylvania early adolescence transitions study (PEATS), the relations between temperament and academic competence were assessed. The PEATS, a short-term longitudinal study, involved six times of testing of approximately 150 northwestern Pennsylvanian early adolescents from the beginning of the sixth grade to the end of the seventh grade (Lerner et al., 1988). In the present study, data from the end of the sixth grade and the beginning of the seventh grade were used.

MEASURES

Several measures were used to appraise the interrelations among adolescent temperament and academic competence, as indexed by standardized tests, GPA, teacher judgements, and adolescent self-ratings.

Temperament was measured by the revised dimensions of temperament survey (DOTS-R), a 54 item self-rating instrument (Windle & Lerner, 1986). Adolescents' temperament was assessed along nine dimensions: activity level-general; activity level-sleep; mood; approach-withdrawal; flexibility-rigidity; rhythmicity-sleep; rhythmicity-eating; rhythmicity-daily habits; and task orientation.

"Objective" Academic Competence was assessed by using the California Achievement Tests/Form C (CAT/C). As an overall index of performance on the CAT/C, the national percentile total score for the sixth grade was used. This objective measure of academic competence was available only at the end of grade 6.

Performance-based Academic Competence, that is, academic competence based on students' classroom performance, was indexed by using the grade card of each subject to determine an overall grade point average (which had a possible range from a high of 5.0 to a low of 0.0).

Subjective Academic Competence was assessed by appraising each subject's view of his/her own academic competence as measured by the scholastic competence score from the Harter (1983) Self-Perception Profile (SPP) for children.

Teachers' Judgements of Academic competence were assessed by appraising the classroom teachers' responses o the Scholastic Competence Scale of the Harter (1983) Teacher's Behavior Rating Scale (TBRS).

For the purpose of data reduction, the nine DOTS-R temperament variables-- activity level-general; activity level-sleep; mood; approach-withdrawal; flexibility-rigidity; rhythmicity-sleep;

rhythmicity-eating; rhythmicity-daily habits; and task orientation--were factor analyzed. Three second order factors emerged (see Table 1). Factor 1 was labelled as Task Rhythmicity and is composed of task-orientation, and rhythmicity in eating, sleeping, and daily habits. Factor 2 was labelled Activity and is made up of sleep activity and of general activity level. The third factor was labelled Adaptation and consists of flexibility, approach behaviors, and positive mood.

Analyses subsequent to this factor analysis indicated that the temperament factor of Adaptation was correlated with GPA and CAT/C scores at the end of Grade 6 ($r=.20$, $p<.01$, and $r=.37$, $p.01$) and with GPA at the end of grade 7 ($r=.27$, $p<.01$) (see Table 2). However, these correlations were not found to be the outcome of the direct influence of Adaptation on academic competence. Using the path analytic procedures illustrated in Figure 1 (as computed through LISREL), we compared: (1) the direct link between temperament and academic competence; with (2) the indirect paths which included the teachers' ratings of scholastic competence and the adolescents' self conceptions of their scholastic functioning.

In respect to the Task Rhythmicity and the Activity factors, indirect paths were also found between these factors, adolescent self ratings, and GPA and CAT/C scores. As with the Adaptation factor, no direct paths were found between these latter two temperament factors and either GPA and CAT/C scores at either grade level.

Figure 2 also indicates that the results of the path analysis involving CAT/c scores are the same as those in the analysis involving GPA, the more objective CAT/C scores are not as well predicted from Teachers' ratings.

CONCLUSIONS

An early adolescents' characteristics of organismic individuality appear to attain functional significance more in a social interactional manner than through any direct, intraindividual link. On the basis of the present evidence, we may conclude that temperamental characteristics of organismic individuality appear to influence adolescent functioning through the promotion of exchanges between the adolescent and his/her social context. Specifically, the present data allow for the interpretation that because of different exchanges evoked with their social context, variations among adolescents in their temperament may place them differentially at risk or advantage in regard to succeeding in scholastic endeavors.

Thus, as the early adolescent continues to encounter challenges to his or her adaptive functioning--for instance as events such as pubertal change and transition form elementary school to junior high school impose stressors which must be coped with-- temperamental characteristics may enable the adolescent to have either an easier or more difficult job coping, depending on specific temperamental attributes possessed by the person. In other words, temperamental fit with the demands of the adolescent's context may constitute an important moderator to the young person's coping with the stressors of this transitionary period.

In sum, the data of this study provides support for the developmental contextual model or person-context relations: Individual difference in developmental change occur via person-context relations evoked by a person's characteristics of individuality.

TABLE 1

FACTOR LOADINGS FOR THE NINE TEMPERAMENT DIMENSIONS OF THE DOTS-R SCALE

DOTS-DIMENSION	FACTOR 1	FACTOR 2	FACTOR 3
ACTIVITY-LEVEL GENERAL	-.004	.722	-.025
ACTIVITY-LEVEL SLEEP	-.181	.525	-.043
APPROACH-WITHDRAWAL	.231	-.095	.412
FLEXIBILITY-RIGIDITY	-.127	-.417	.510
QUALITY OF MOOD	.100	.087	.641
RHYTHMICITY-SLEEP	.498	-.015	.190
RHYTHMICITY-EATING	.633	-.149	.182
RHYTHMICITY-HABITS	.767	.062	-.039
TASK ORIENTATION	.291	-.193	.009

NOTE: $X^2 = 12.926$ DF= 12 P = ..37

TABLE 2

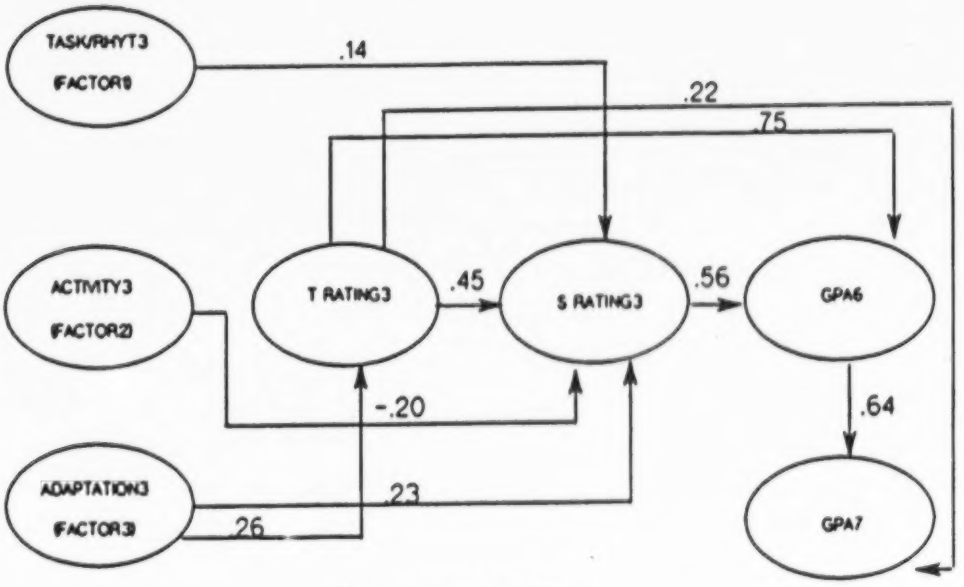
INTERCORRELATIONS AMONG TEMPERAMENT FACTORS (TASK RHYTHMICITY, ACTIVITY, AND ADAPTATION), TEACHER-RATED SCHOLASTIC COMPETENCE (T RATING), SELF-PERCEIVED SCHOLASTIC COMPETENCE (S RATINGS), STANDARDIZED ACADEMIC COMPETENCE AT THE END OF GRADE 6 (CAT/C6), GRADE POINT AVERAGE AT THE END OF GRADE 6 (GPA6), AND GRADE POINT AVERAGE AT THE END OF GRADE 7 (GPA7)

VARIABLE	1	2	3	4	5	6	7	8
1. TASK-RHY	--							
2. ACTIVITY	-.02	--						
3. ADAPTATION	.06	-.10	--					
4. T RATING	.07	.01	.26**	--				
5. S RATING	.19*	-.23*	.38**	.51**	--			
6. GPA6	.10	-.05	.29**	.83**	.56**	--		
7. CAT/C6	.06	-.13	.37**	.71**	.55**	.69**	--	
8. GPA7	.05	-.18	.27**	.80**	.50**	.85**	.72**	--

*p < .05

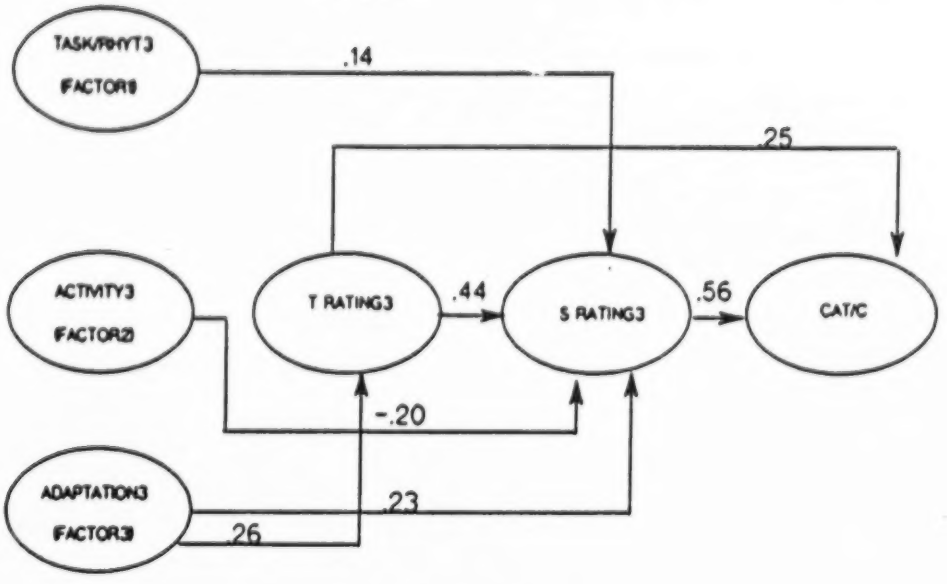
**p < .001

FIGURE 1



$X^2(12) = 12.98$ p=.37
goodness of fit index is .97

FIGURE 2



$x^2(8) = 9.47$ p=.30
goodness of fit index is .97

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